

REMARKS/ARGUMENTS

In a telephone conversation with the Examiner, the applicant's attorney provisionally elected Group II, claims 11-20 for prosecution. The applicants affirm this election.

The abstract and the title of the invention are objected to. Accordingly, the applicants have amended both the abstract and the title to overcome the objections.

Claims 11-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in a number of instances. The applicants have, accordingly, amended the claims to overcome these rejections.

Claims 1-10 have been withdrawn. Claims 11-20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Buongiorno (5,679,174) in combination with Swanick (1,492,905) or Kenton et al. (5,464,479). In response, the applicants have amended the claims to more clearly distinguish over the cited references. The applicants believe that the amended claims are patentably distinctive over the cited references for the reasons discussed hereinbelow.

The present invention relates to a method of simultaneously flushing the inner surfaces of a plurality of cavities in each of a plurality of parts with each part having at least a pair of openings and associated internal cavities by installing the parts into a holder, providing a guide member having passages that are aligned with the respective part openings, providing a manifold with a plurality of probes registering with the respective guide member passages, advancing the manifold and probes such that the probes pass through the respective passages and into the respective internal cavities, and causing high pressure fluid to flow through the probes and into the cavities to flush out foreign matter therefrom. In this way, multiple cavities in each of multiple blades can be simultaneously flushed in a single process.

The Buongiorno patent shows a process and apparatus for cleaning deposits from gas turbine engines by locating or drilling a single hole into the cavity of the component, inserting a cleaning tube into the cavity and cleaning the deposits from the cavity with a high pressure water stream.

In an alternative Fig. 2 embodiment, the stationary platform 24 is located within a chamber 10 and a component is mounted to a holding fixture that is in turn mounted to the platform 24. A cleaning tube 21 is then advanced, by way of an input shaft 22, into the hole in the component for cleaning. It will thus be seen that the Buongiorno reference shows only a single probe being advanced into a single hole in a single blade.

The Swanick reference shows a method and apparatus for unloading high explosive shells. A trough 1 which includes a plurality of upstanding vertical tubular shell guides 2 has permanently installed therein a steam supply pipe 3 with individual nozzles 4 extending into the respective shell guides 2. The shells, having a relatively large opening in their point are inserted into the shell guides 2 such that the nozzles pass through the opening and into the area of the charge. Steam is then caused to flow through the supply pipe, into the nozzles and out a plurality of apertures to cause the charge to be washed out of the shell and flow with the water down through the opening at the point of the shell. This is substantially different from the applicant's invention wherein the parts each have a plurality of openings and cavities therein, the parts are held in place while the probes are advanced first through the guide member, and then through the plurality of openings in the parts to reach the plurality of apertures.

The Kenton et al. reference shows a method for removing undesired material from internal spaces of turbine blade by first immersing the blades in water and allowing more water to be absorbed by the material, freezing the combination such that the material is broken up, and then using pressurized water to flush out the shattered material. The flushing is accomplished by attaching a pump to the plurality of blades by a plurality of hoses to thereby pump water into the internal cavities. This would appear to be a rather labor intensive approach that requires the attachments of individual hoses to the individual blades rather than simply advancing the plurality of probes as in the present invention. Further, the Kenton et al. approach would not have the advantage of specifically directing the liquid flow to particular cavity locations as is the case with the probes of the present invention.

In respect to the Buongiorno reference, the applicants agree with the Examiner that the reference does not show or suggest the installing of a plurality of parts into a holder, providing a guide member, or providing a manifold as claimed by the applicants. The applicants, however, do not agree that the reference discloses all other limitations. In particular, it does not show or suggest inserting a plurality of tubes into each of a plurality of parts.

In respect to the Swanick reference, the applicants believe that it is non-analogous art and should therefore not be considered as prior art to be obviously combined with the features of the Buongiorno reference as suggested by the Examiner. That is, for the purpose of improving its manufacturing processes, one skilled in the art of the manufacture of turbine blades is not likely to look to a 1924 patent that shows a method and apparatus for unloading high explosive shells.

Assuming arguendo, that the Swanick reference is analogous art, and further that features of the Swanick reference were incorporated in the Buongiorno method, it would not result in the applicant's invention. The teachings of Swanick of providing permanently installed multiple probes would not obviously lead one to adapt the Buongiorno reference to include a plurality of advanceable probes into a plurality of blades. Further, there is clearly no showing or suggestion by either of the references to provide a plurality of probes that are advanced into each of the parts as claimed by the applicants.

The Examiner has said that "Swanick discloses a method and apparatus for cleaning internal surface of a component (emphasis added)". The applicants disagree. The purpose of Swanick is to completely wash out the contents of the shell rather than to clean the internal surfaces. It is therefore not a surface cleaning method but rather a contents emptying procedure. The Examiner further states that Swanick "Discloses the installing step, the manifold, and the guide member as claimed". The applicants again disagree. If Swanick does provide a guide member, it is the vertical tubular shell guides and therefore cannot be reasonably considered to be a "guide member having a plurality of passages formed therein, including adjacent passages that are in a common plane parallel to said first plane and

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including adjacent passages that are in a common plane other than said first plane and wherein said each of said passages has an axis aligned in coincidence with the respect part opening”.

Although the Kenton et al. reference teaches the step of installing a plurality of parts into a fixture, and Buongiorno teaches the advancement of single cleaning tube into a single blade cavity, there is no showing or suggestion in either of the two references, taken individually or in combination, that individual probes be simultaneously advanced by way of a manifold to enter into the respective blades. In fact, Kenton et al. would teach away from that concept since it shows the connection being made by way of hoses.

Again, there is clearly no showing in either Buongiorno or Kenton reference taken individually or in combination, the concept of flushing the inner surfaces of a plurality of cavities in each of a plurality of parts.

For the reasons discussed hereinabove, the applicants believe that the claims, as amended, are patentably distinctive over the cited references. A reconsideration of the Examiner's rejections and a passing of the case to issue is therefore respectfully requested.

If the Examiner wishes to expedite disposition of the above-captioned patent application, he is invited to contact Applicant's representative at the telephone number below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 21-0279.

Respectfully submitted,

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